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July 30, 2013

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Planning and Building Department
276 Fourth Avenue, MS P-101
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Reference: Year 1 Annual Report for the Otay Ranch Coastal Cactus Wren Habitat
Restoration and Enhancement Program (SANDAG Grant Number 5001970;
RECON Number 6649)

Introduction

This first annual report provides background information and summarizes the tasks performed during the first year (July 2, 2012 to June 30, 2013) of the coastal cactus wren (*Campylorhynchus brunneicapillus*) habitat restoration and enhancement program located within the Otay Ranch Preserve. Three quarterly reports have previously been prepared by RECON in 2013. Information from those reports is summarized below. This annual report also summarizes the results of the relevé vegetation surveys that were conducted in spring 2013 at the treatment sites, as well as the results of both the pre- and post-implementation focused coastal cactus wren surveys.

The target areas for restoration/enhancement within Salt Creek are all located within the Otay Ranch Preserve (Figures 1–2; see Attachment 1 for all figures and photographs). Overall, the Otay Ranch Preserve currently contains 2,978 acres of preserve land established to create an open space system that will protect natural resources and provide a series of interconnected viable habitats to protect Multiple Species Conservation Program (MSCP)-covered species and regional wildlife corridors. Sensitive habitat communities identified within the Preserve include maritime succulent scrub, coastal sage scrub, valley needlegrass grassland, non-native grassland, southern willow scrub, freshwater marsh, cismontane alkali marsh, and Baccharis floodplain scrub. Sensitive species observed on-site include coastal cactus wren, coastal California gnatcatcher (*Polioptila californica californica*), coast horned lizard (*Phrynosoma blainvillii*), variegated dudleya (*Dudleya variegata*), San Diego barrel cactus (*Ferocactus viridescens*), and snake cholla (*Cylindropuntia californica* var. *californica*).

Coastal Cactus Wren Status and Conservation

Populations of the coastal cactus wren are in decline throughout much of southern California, including San Diego County. Over the last decade, large, intense fires have damaged coastal cactus wren habitat in the Lake Jennings area (Cedar Fire, 2003), the San Pasqual Valley (Witch Fire, 2007), and the Otay–Sweetwater region, which includes the San Diego National Wildlife Refuge (Harris Fire, 2007). This recent trend of cactus wren population decline has been observed in other regions of southern California. Regional recovery efforts for coastal populations of cactus wrens are intended to stabilize and eventually increase population sizes.

Coast cholla (*Cylindropuntia prolifera*) die-off has likely contributed to a decrease in suitable habitat for coastal cactus wren and the observed population declines. In the Otay Ranch Preserve coast cholla patches have declined in the last 10–15 years due to competition with weeds and large shrubs such as lemonadeberry (*Rhus integrifolia*). Cactus wrens typically forage on the ground, and thick weed cover can prevent the wrens from finding their prey. In addition, the below-average rainfall during most of the last decade has caused many patches of coast cholla to suffer or die from severe drought stress.

Coastal cactus wren surveys performed in 2009–2010 by the Otay Ranch Preserve Steward/Biologist detected four pairs, two solitary individuals, and 36 nests within Salt Creek. Incidental sightings of coastal cactus wren made on other surveys added an additional five pairs and nine solitary individuals (RECON 2011). One of the pairs was detected with a third—juvenile—wren, indicating a possible family unit.

Salt Creek is identified in the Otay Ranch Resource Management Plan (RMP) as an avian corridor for coastal cactus wren and California gnatcatcher, providing north/south movement from the Otay River Valley. Salt Creek connects with the Otay River Valley just west of the Lower Otay Reservoir. This corridor system provides a critical linkage to several MSCP-designated biological core areas, including the Otay River, Wolf Canyon, Otay Lakes, Otay Mountain (with connections east toward Tecate Peak), the Jamul Mountains, San Miguel Mountain, and the upper Sweetwater River.

Project Goals and Habitat Restoration Methods

- Restore/enhance approximately 15 acres of degraded habitat for coastal cactus wrens within Salt Creek.
- Reduce the risk of cactus wren habitat loss from fires.
- Reduce weed infestation.
- Remove invasive seed sources that can migrate to adjacent sensitive habitat areas.
- Benefit other Covered Species by reducing weed competition.
- Revitalize an existing avian wildlife corridor by establishing complementary coastal cactus wren projects in the vicinity (i.e., County of San Diego).

Year 1 Tasks Performed from July 2012 (Effective Date of Agreement) to June 2013

Pre-implementation

Site Selection and Monitoring (Tasks 2a,b,c,d)

In August 2012 RECON biologists Anna Bennett and Mark Dodero located and mapped the proposed cholla planting areas at Salt Creek (Figure 3). Cactus wren nests had been previously observed in the vicinity of the project site in an existing cholla patch at the eastern edge of treatment area 5 (see Figure 3). The selection of the proposed planting areas is intended to mimic the south-facing cholla-dominated slopes found farther west in the Otay Valley.

Approximately 15 acres of potential planting area were identified in six habitat patches. The sites selected generally have a southern exposure and range from southwest to south and southeast (Photographs 1–2). Existing low-density cholla is present in these areas, and this enhancement program is intended to create much larger cholla patches that will be more attractive to cactus wrens. The areas selected for restoration and enhancement were generally the least weedy available sites with natural openings between existing shrubs.

Once the restoration/enhancement sites were selected and prior to implementation, permanent photo points were established. Also in early September 2012, RECON biologists Beth Procsal and Erin McKinney conducted pre-implementation surveys for coastal cactus wren. Cactus wren

survey methods are described below. Vegetation sampling was conducted in spring 2013, and the sampling methods are described below.

Monitoring Methods

Bird Surveys (Tasks 2b,f)

A preimplementation fall survey was conducted by RECON biologists Beth Procsal and Erin McKinney at six proposed restoration areas for the coastal cactus wren on September 6, 2012 in order to detect the current use of this species. To cover the entire survey area each biologist surveyed different sides of the survey area for approximately 10–15 minutes. A focused Year 1 spring survey was conducted by RECON biologist Beth Procsal on May 15, 2013 at six survey sites where restoration had occurred to support this species. Survey methods included walking through the designated areas at a slow pace, listening and looking for bird activity for approximately 20–25 minutes per area. All wildlife detected either visually or by call during the survey were noted and listed in Attachment 2 for the fall survey and in Attachment 3 for the spring survey. The results of these surveys are summarized below in the Cactus Wren Survey Results section.

Vegetation Sampling (Task 2g)

Vegetation patch sampling was done using the relevé method. All plant species occurring in each patch were recorded, and the cover of each species was estimated. Each of the six vegetation treatment areas was sampled by RECON biologist Anna Bennett on May 15 and May 31 2013 after weed control efforts had been completed for the season. The results of the vegetation sampling efforts are presented in the Year 1 Vegetation Sampling Results section below, and the plant species list is presented in Attachment 4.

2012–13 Rainfall Summary

Between July 1, 2012 and June 30, 2013, rainfall at Brown Field, the closest reporting station, was 7.27 inches (Table 1), which was below normal (the average annual rainfall is approximately 10 inches). Relatively light rains fell in October and November. Heavy rains occurred in mid- to late December 2012, when nearly 2.50 inches of rain fell. This heavier rain episode was followed by slightly below normal rainfall in January 2013 and well below normal rainfall in February, March, and April. Weeds generally did not germinate in large numbers until late December 2012 after the occurrence of heavy rains.

TABLE 1
SUMMARY OF RAINFALL DATA BY MONTH AT CHULA VISTA
JULY 1, 2012–JUNE 30, 2013

Month	Monthly Rainfall (inches)
July	Trace
August	0.04
September	0.05
October	0.61
November	0.26
December	2.37
January	1.89
February	0.65
March	1.08
April	0.11
May	0.21
June	0.00
Total Precipitation	7.27 inches

Implementation

Site Preparation, Cholla Collection and Planting (Tasks 1a,b,e)

The restoration crew collected cholla cuttings and planted the cuttings within approximately 15 acres of suitable habitat in September and October 2012 (Photographs 3–5). Cholla cuttings were taken from existing cholla patches and were distributed in openings in the coastal sage scrub (Photographs 6–8). Cholla segments were either placed horizontally in contact with the soil surface or a small hole was excavated, and the base of the cutting was placed in the soil (Photograph 9). Areas of soil that supported cryptogamic crusts were avoided for planting to minimize disturbance to the ashy spike-moss (*Selaginella cinerascens*) and other cryptogams.

In areas where no nesting-sized cholla were present, larger cholla stems were collected from existing patches in Salt Creek and planted (Photographs 10–11). These larger stems, approximately two to three feet tall, were planted to encourage wrens to nest in those areas sooner than the slower growth from single stems cuttings would have allowed. A smaller quantity of shore cactus (*Opuntia littoralis*) was also collected and planted (Photographs 12–13). The shore cactus provide fruits that the cactus wrens can forage on in the fall when insect populations may be lower. RECON biologists monitored the restoration crew during cholla collection and planting.

Blue (Mexican) Elderberry Propagation (Tasks 1c,d)

The scope of work for this restoration project calls for the propagation of 100 blue elderberry ([*Sambucus nigra* ssp. *caerulea*] formerly known as Mexican elderberry [*Sambucus nigra*]) plants. Once the plants have germinated and are of sufficient size, 20 of these plants are to be taken to High Tech Middle Chula Vista for care prior to outplanting. The other 80 elderberry plants are to be maintained at the RECON nursery, until they are large enough to be planted on-site during the cool winter season in Year 2.

Seed production for this species had been poor throughout San Diego County in 2012. As an alternate method of production, cuttings were collected for propagation in the spring of 2013 after the stems had become hydrated from recent rains. As propagation from stem cuttings has had only limited success in 2013, seeds will be collected to propagate additional plants to achieve the necessary number of plants.

Maintenance

Weed Control (Task 1e)

Early light rains in October and November caused the germination of filaree (*Erodium* spp.) in small numbers, but the cool dry weather into early December limited their growth. As mentioned above, heavier than normal rain occurred in mid-December 2012, which caused additional weeds to germinate. Annual weeds were sprayed by RECON crews beginning in late February and continuing in March and April to prevent them from flowering and setting seeds (Photographs 14–15). Glyphosate was used to control non-native annuals in planting areas. Non-native species that were controlled included tocalote (*Centaurea melitensis*), short-pod mustard (*Hirschfeldia incana*), filaree (*Erodium* spp.), slender wild oat (*Avena barbata*), and other annual grasses such as red brome (*Bromus madritensis* ssp. *rubens*). Herbicide was applied by licensed applicators under the supervision of RECON Field Crew Director Ruth Vallejo, who is a certified Pest Control Advisor.

Year 1 Cactus Wren Survey Results

During the fall 2012 pre-implementation survey, 14 species of birds were detected within the six proposed restoration areas. The following bird species were the most commonly observed (in descending order) during the fall 2012 survey. All bird species detected either visually or by call during the survey were noted and are listed in Attachment 2. Sensitive species locations are shown in Figure 4. No coastal cactus wren were detected during this fall survey.

- California towhee (*Pipilo crissalis*)
- Anna's hummingbird (*Calypte anna*)

- coastal California gnatcatcher
- Bewick's wren (*Thryomanes bewickii*)
- lesser goldfinch (*Carduelis psaltria hesperophilus*)
- wrenit (*Chamaea fasciata henshawi*)
- house finch (*Carpodacus mexicanus frontalis*)

In spring 2013, 20 species of birds were detected within the six restoration areas during the coastal cactus wren survey. The following species of birds were the most commonly observed (in descending order) during the spring 2013 survey. All wildlife detected either visually or by call during the survey were noted and are listed in Attachment 3. No coastal cactus wren were detected during this survey.

- California towhee
- southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)
- wrenit
- mourning dove (*Zenaida macroura*)
- lesser goldfinch
- Say's phoebe (*Sayornis saya*)
- greater roadrunner (*Geococcyx californianus*)

Year 1 Vegetation Sampling Results

Attachment 4 lists the plant species observed at the six vegetation treatment areas.

The following results are from the six relevé locations:

- Average cholla height:
 - Less than 1 foot: 97%
 - Between 1 and 3 feet in height: 3%
 - Over 3 feet in height: <1%
- Average total cover (shrub and herbaceous): 34%
- Average bare ground: 66%
- Average total cover of cholla: 1%
- Average percent cholla cover out of the total cover: 3%
- A total of 56 plant species were recorded at the relevé locations: 44 native species and 12 non-native species.
- Average non-native cover: 11%
- Average non-native cover out of the total cover: 31%

Previous Reporting—Quarterly Reports (Task 3a)

Quarterly reports that summarized ongoing tasks for the project were submitted in November 2012 as well as in February and April 2013. An additional Statement of Services summary report was submitted in July 2013.

Discussion

Weed Control Results

Because of intensive maintenance efforts, weed cover at the restoration and enhancement sites was relatively low across the six sites at an average of 11 percent. Multiple spray visits were

effective at controlling weed growth. Spraying was focused around the newly planted cholla patches, but all areas within the six restoration and enhancement sites were treated. By controlling non-native weeds, more water becomes available to the newly rooted cactus cuttings.

Cactus Growth

The cactus cuttings showed their first sign of new growth in mid-January, as new shoots began to appear (Photograph 16). The cuttings could be seen to swell with water as they developed new root systems after being planted (Photograph 17). The taller cholla that were planted also began to show new growth in the spring (Photograph 18). Rains tapered off in mid-March, and dry and warmer weather eventually stopped the new stem growth from expanding further, but the plants will be capable of good growth in the future with established root systems (Photograph 19).

Other species of cactus and succulents that are present on the slopes and that benefit from the weeding program include: narrow endemic snake cholla (*Cylindropuntia californica* var. *californica*), narrow endemic variegated dudleya, MSCP-covered coast barrel cactus, and non-MSCP-covered fish-hook cactus (*Mammillaria dioica*) (Photographs 20–23). The variegated dudleya was a newly discovered population for Salt Creek. Sensitive plant locations are shown on Figure 4.

Cactus cuttings in conjunction with fencing were also used to close unauthorized roads in the Preserve. To protect sensitive resources in the area, Otay Ranch Preserve funding was used to install fencing to restrict access at habitat restoration area 1 (see Figure 4 and Photograph 24). After the Preserve fencing was installed, cactus cuttings were planted in the closed roads to discourage vehicles from entering the site (Photographs 25–26).

Cactus Wren and Other Wildlife Use

No coastal cactus wrens or nests were detected during the fall or spring surveys. Cactus wren nests had been incidentally observed in the vicinity of the project during 2009–2010 (see Figure 3). Another sensitive bird species, coastal California gnatcatcher, was observed at five locations (see Figure 4). Other commonly encountered species that forage in and around the edges of the enhancement sites included the California towhee, Anna's hummingbird, house finch, and mourning dove.

Reptiles observed in the cactus wren restoration and enhancement sites include the common western fence lizard (*Sceloporus occidentalis*) and gopher snake (*Pituophis catenifer annectens*) (Photograph 27). Sensitive reptile species also observed include the MSCP-covered Belding's orange-throated whiptail (*Aspidoscelis hyperythrus*) and coast horned lizard (*Phrynosoma coronatum blainvillii*) (Photograph 28).

Mammal species that were detected at the restoration and enhancement sites include California ground squirrel (*Spermophilus beechyi*) (Photograph 29), San Diego black-tailed jackrabbit, and San Diego desert woodrat (*Neotoma lepida intermedia*); San Diego black-tailed jackrabbit and San Diego desert woodrat are both California Department of Fish and Wildlife Species of Special Concern. Invertebrates that were observed include Behr's metalmark (*Apodemus mormo virgultii*) and grey hairstreak (*Strymon melinus*) (Photograph 30).

Public Outreach/Awareness—High Tech Middle Chula Vista

As part of the scope of work for the cactus wren grant, RECON biologists conducted nature walk field trips to the Salt Creek portion of the Otay Ranch Preserve for Ms. Ann McAfee's two seventh grade classes at High Tech Middle Chula Vista (conducted without compensation by RECON; Photograph 31).

The field trips focused on educating the students about sensitive species in the Preserve, including coastal cactus wrens, western burrowing owls (*Athene cunicularia hypugaea*), and Otay tarplant (*Deinandra conjugens*) among others. Topics of discussion during the field trips included

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general ecology and natural history of the native habitats and species present in the Preserve, as well as the management challenges that invasive species cause.

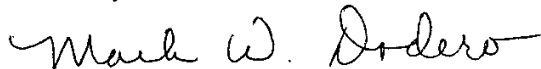
Approximately 120 cholla cuttings were transported to High Tech Middle Chula Vista and were planted in one-gallon pots by the students. The cholla cuttings will be transplanted to the Preserve in Year 3 of the project (Photographs 32–34). These cholla cuttings are being grown to a larger size to provide nesting-sized cholla for the cactus wren population at Salt Creek.

Future Restoration and Enhancement Tasks

In Year 2 of the restoration and enhancement program, weeds will continue to be controlled, as needed, to prevent seed set. Vegetation sampling and cactus wren population monitoring will be repeated in the spring of 2014.

If you have any questions regarding the coastal cactus wren habitat restoration and enhancement program, do not hesitate to call.

Sincerely,



Mark Dodero
Senior Biologist
MWD:eab

Enclosure(s)

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Contributors to this Report

RECON biologists that conducted field surveys and analyzed data included Anna Bennett, Beth Procsal, Erin McKinney, and Cailin O'Meara.

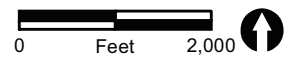
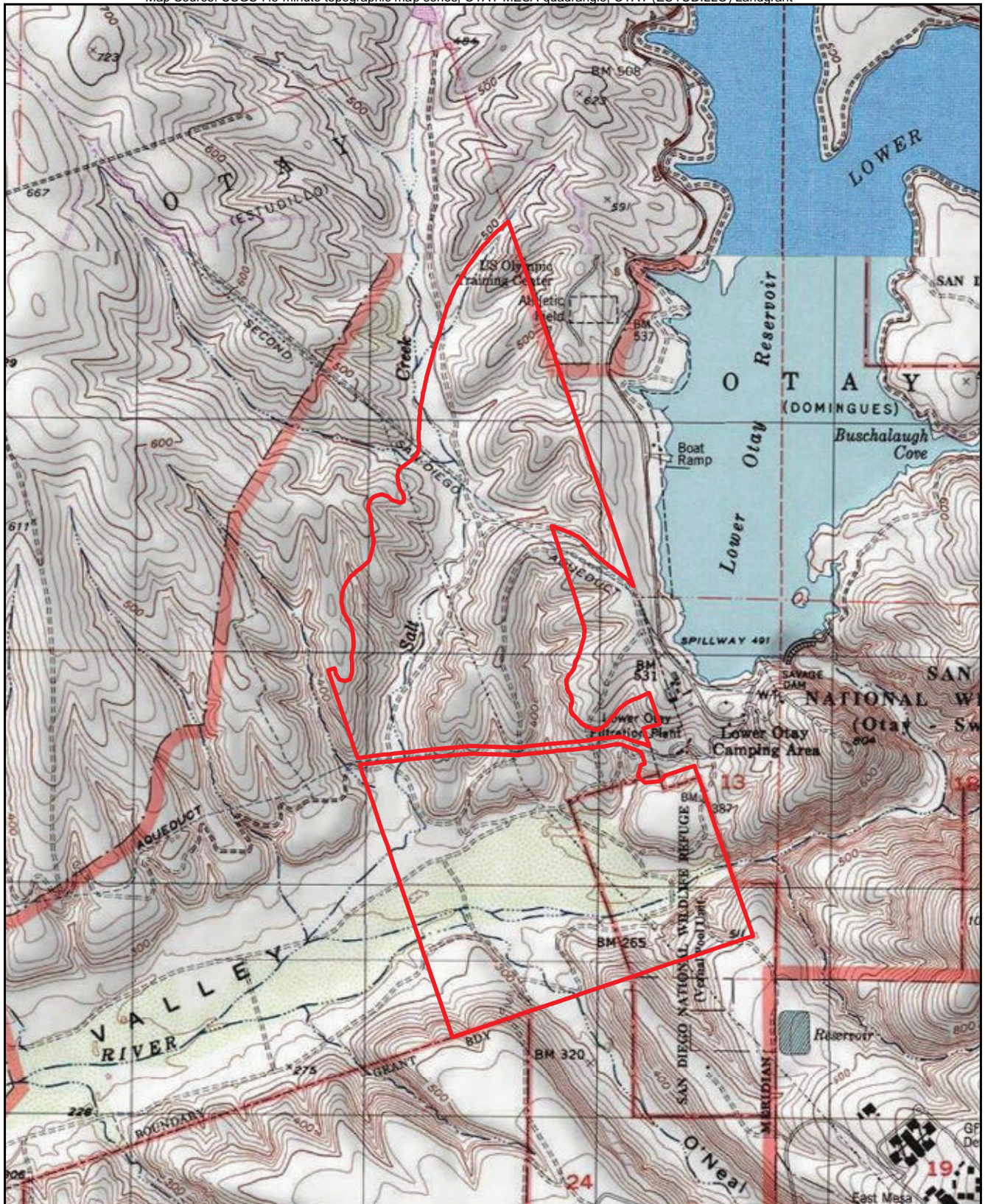
ATTACHMENTS

ATTACHMENT 1



Otay Ranch Preserve: Salt Creek Parcels

FIGURE 1



Otay Ranch Preserve: Salt Creek Parcels

FIGURE 2



- Preserve Boundary
- City of Chula Vista MSCP
- Cactus Wren Habitat Restoration Areas

- Sensitive Wildlife Species**
- Coastal Cactus Wren (*Campylorhynchus brunneicapillus*) Nests, Observed in 2009



FIGURE 3

Cactus Wren Habitat Restoration and Enhancement Locations



- Preserve Boundary
- City of Chula Vista MSCP
- Cactus Wren Habitat Restoration Areas
- Fencing Installed February 2013

- Sensitive Plant Species**
- Snake Cholla (*Cylindropuntia californica*)

- Sensitive Wildlife Species**
- Belding's Orange-throated Whiptail (*Aspidoscelis hyperythra beldingi*)
 - Coast Horned Lizard (*Phrynosoma blainvillii*)
 - Coastal California Gnatcatcher (*Polioptila californica californica*)
 - San Diego Black-tailed Jackrabbit (*Lepus californicus bennettii*)
 - San Diego Desert Woodrat (*Neotoma lepida intermedia*)
 - Southern California Rufous-crowned Sparrow (*Aimophila ruficeps canescens*)
 - Yellow warbler (*Dendroica petechial*)

0 Feet 400



FIGURE 4
Locations of Sensitive Species



PHOTOGRAPH 1
View Looking West from Restoration Site 1 Prior to Implementation



PHOTOGRAPH 2
View Looking Southeast from Restoration Site 4 Prior to Implementation



PHOTOGRAPH 3
RECON Crew Collecting Cholla Cuttings



PHOTOGRAPH 4
Containers Full Of Cholla Being Carried to Truck



PHOTOGRAPH 5
Container with Numerous Cholla Cuttings



PHOTOGRAPH 6
Cholla Cuttings Being Distributed at the Restoration Site



PHOTOGRAPH 7
Small Hand Tools Were Used to Excavate Planting Holes



PHOTOGRAPH 8
RECON Field Crew Planting Cactus Cuttings



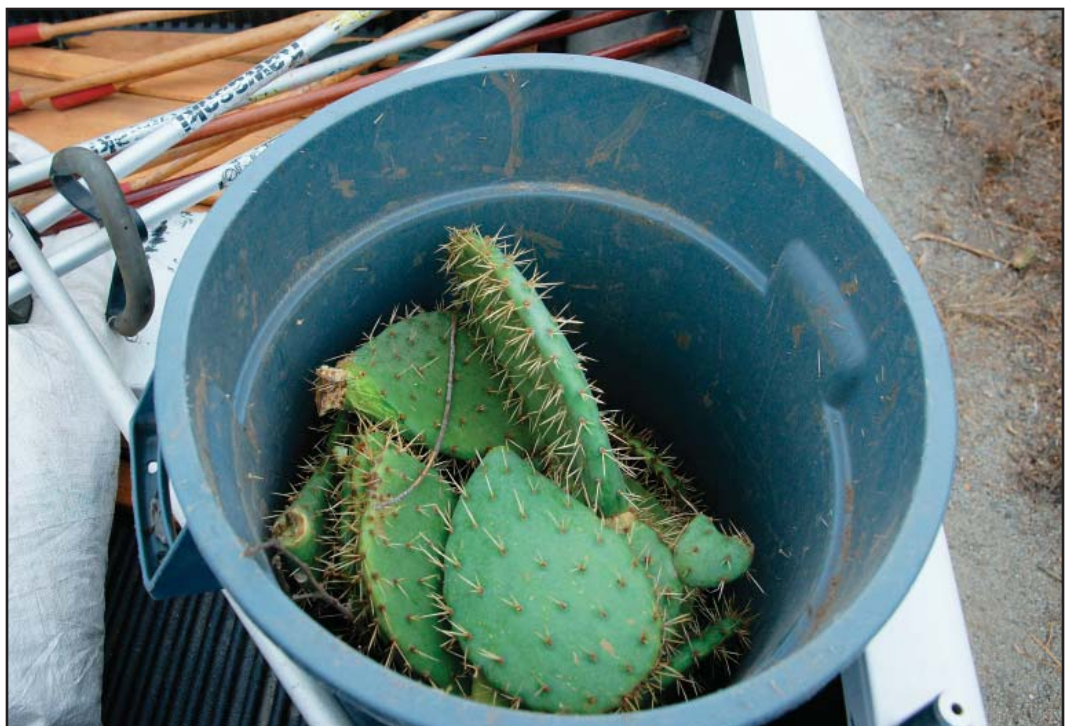
PHOTOGRAPH 9
Cholla Cuttings Immediately After Planting



PHOTOGRAPH 10
Larger Cholla Stems Mixed with Smaller Cuttings



PHOTOGRAPH 11
Cholla Cuttings Immediately After Planting



PHOTOGRAPH 12
Shore Cactus Cuttings Collected for Planting



PHOTOGRAPH 13
Shore Cactus Pads and Cholla Cuttings After Planting



PHOTOGRAPH 14
RECON Crews Spraying Non-natives



PHOTOGRAPH 15
RECON Crews Spraying Non-native Annual Grasses



PHOTOGRAPH 16
Cholla Cutting Showing New Growth January 2013



PHOTOGRAPH 17
Planted Cholla Cuttings February 2013



PHOTOGRAPH 18
Taller Cholla Stem Starting New Growth March 2013



PHOTOGRAPH 19
Cholla Cutting with New Stems April 2013



PHOTOGRAPH 20
Narrow Endemic Snake Cholla Benefits from Weed Control Efforts



PHOTOGRAPH 21
New Population of Narrow Endemic
Variegated Dudleya Found in 2013



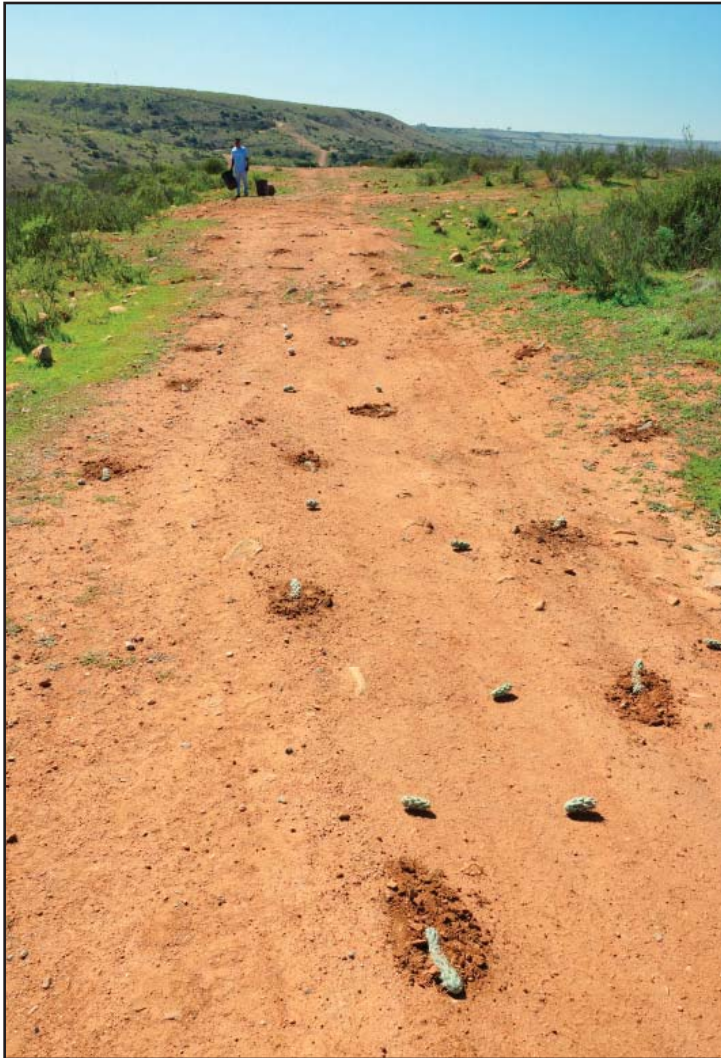
PHOTOGRAPH 22
MSCP Covered Coast Barrel Cactus Also Benefits from Weeding



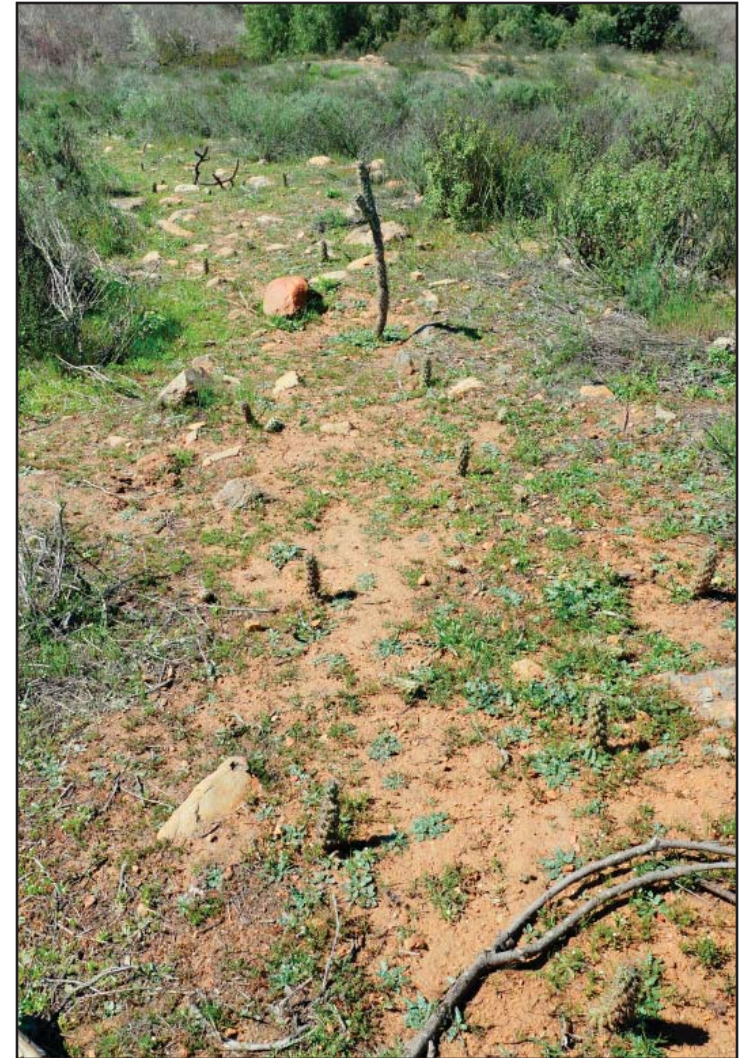
PHOTOGRAPH 23
Fish-Hook Cactus Growing in the Restoration Area



PHOTOGRAPH 24
Newly Installed Protective Fencing to Close Unauthorized Roads



PHOTOGRAPH 25
Newly Planted Cholla
Cuttings to Discourage Vehicles



PHOTOGRAPH 26
Cholla Stems Planted for Trail Closure



PHOTOGRAPH 27
Gopher Snake at the Preserve



PHOTOGRAPH 28
Coast Horned Lizard at the Restoration Site



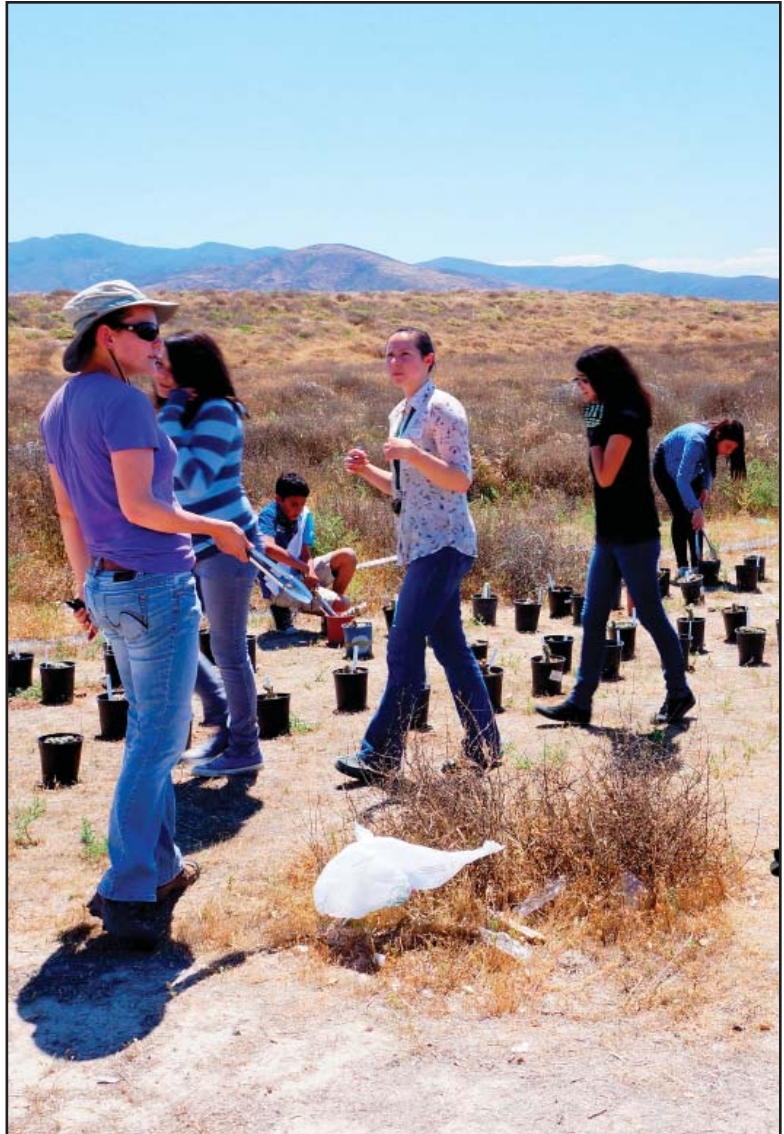
PHOTOGRAPH 29
California Ground Squirrel at Salt Creek



PHOTOGRAPH 30
Grey Hairstreak Butterfly on Jojoba



PHOTOGRAPH 31
High Tech Middle Chula Vista Seventh Graders on Nature Walk Field Trip



PHOTOGRAPH 32
High Tech Middle Chula Vista Seventh
Graders Planting Cholla Under Supervision



PHOTOGRAPH 33
High Tech Middle Chula Vista Seventh Graders Planting Cholla



PHOTOGRAPH 34
One Gallon Pots with Cholla After Planting by Students

ATTACHMENT 2

ATTACHMENT 2
WILDLIFE SPECIES OBSERVED/DETECTED DURING THE FALL 2012 CACTUS
WREN SURVEY AT THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND ENHANCEMENT SITE

Scientific Name	Common Name	Treatment Area Number
ACCIPITRIDAE	HAWKS, KITES, & EAGLES	
<i>Buteo jamaicensis</i>	red-tailed hawk	3, 6
COLUMBIDAE	PIGEONS & DOVES	
<i>Zenaida macroura marginella</i>	mourning dove	1, 6, 7
CORVIDAE	CROWS, JAYS, & MAGPIES	
<i>Corvus corax clarionensis</i>	common raven	6
EMBERIZIDAE	EMBERIZIDS	
<i>Pipilo crissalis</i>	California towhee	1, 4, 5, 6
<i>Pipilo maculatus</i>	spotted towhee	5
FRINGILLIDAE	FINCHES	
<i>Carduelis psaltria hesperophilus</i>	lesser goldfinch	2, 4, 6
<i>Carpodacus mexicanus frontalis</i>	house finch	1, 2, 6,
ODONTOPHORIDAE	NEW WORLD QUAIL	
<i>Callipepla californica californica</i>	California quail	1, 5
PARULIDAE	WOOD WARBLERS	
<i>Geothlypis trichas</i>	common yellowthroat	6
PICIDAE	WOODPECKERS & SAPSUCKERS	
<i>Picoides nuttallii</i>	Nuttall's woodpecker	6
SYLVIIDAE	GNATCATCHERS	
<i>Polioptila californica californica</i>	coastal California gnatcatcher	1, 2, 5, 6
TIMALIIDAE	BABLERS	
<i>Chamaea fasciata henshawi</i>	wrentit	1, 3, 6
TROCHILIDAE	HUMMINGBIRDS	
<i>Calypte anna</i>	Anna's hummingbird	2, 4, 5, 6
TROGLODYTIDAE	WRENS	
<i>Thryomanes bewickii</i>	Bewick's wren	3, 4, 6

Nomenclature from:

American Ornithologists' Union

1998 *Check-list of North American Birds*. 7th ed. American Ornithologists' Union, Washington, D.C.

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ATTACHMENT 3

ATTACHMENT 3
WILDLIFE SPECIES OBSERVED/DETECTED DURING THE SPRING 2013 CACTUS WREN SURVEY
AT THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND ENHANCEMENT SITE

Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
BIRDS (Nomenclature from American Ornithologists' Union 1998 and Unitt 2004)				
ODONTOPHORIDAE	NEW WORLD QUAIL			
<i>Callipepla californica californica</i>	California quail	1	C / Y	O, V
ACCIPITRIDAE	HAWKS, KITES, & EAGLES			
<i>Buteo jamaicensis</i>	red-tailed hawk	FO-2	C / Y	O, V
COLUMBIDAE	PIGEONS & DOVES			
<i>Zenaida macroura marginella</i>	mourning dove	4, 6	C / Y	O, V
CUCULIDAE	CUCKOOS & ROADRUNNERS			
<i>Geococcyx californianus</i>	greater roadrunner	2, 3	C / Y	O
APODIDAE	SWIFTS			
<i>Aeronautes saxatalis</i>	white-throated swift	FO-1	C / Y	O, V
TROCHILIDAE	HUMMINGBIRDS			
<i>Calypte anna</i>	Anna's hummingbird	2	C / Y	O, V
TYRANNIDAE	TYRANT FLYCATCHERS			
<i>Myiarchus cinerascens cinerascens</i>	ash-throated flycatcher	1	F / S	O, V
<i>Sayornis saya</i>	Say's phoebe	2, 4	F / W	O, V
<i>Tyrannus vociferans vociferans</i>	Cassin's kingbird	1	C / Y	O, V
CORVIDAE	CROWS, JAYS, & MAGPIES			
<i>Corvus corax clarionensis</i>	common raven	2, FO-5	C / Y	O
HIRUNDINIDAE	SWALLOWS			
<i>Petrochelidon pyrrhonota tachina</i>	cliff swallow	FO-2, 4	C / S	O
SYLVIIDAE	GNATCATCHERS			
<i>Polioptila californica californica</i>	coastal California gnatcatcher	6	F / Y	O, V
TIMALIIDAE	BABBLERS			
<i>Chamaea fasciata henshawi</i>	wrentit	3, 4, 5	C / Y	O, V

ATTACHMENT 3
WILDLIFE SPECIES OBSERVED/DETECTED DURING THE SPRING 2013 CACTUS WREN SURVEY
AT THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND ENHANCEMENT SITE
(cont.)

Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
BIRDS cont. (Nomenclature from American Ornithologists' Union 1998 and Unitt 2004)				
PTILOGONATIDAE <i>Phainopepla nitens lepida</i>	SILKY FLYCATCHERS phainopepla	1	F / Y	O, V
PARULIDAE <i>Dendroica petechia</i>	WOOD WARBLERS yellow warbler	3	F / S	O, V
EMBERIZIDAE <i>Aimophila ruficeps canescens</i>	EMBERIZIDS southern California rufous-crowned sparrow	1, 3, 4, 6	C / Y	O, V
<i>Pipilo crissalis</i>	California towhee	1, 2, 3, 4, 5, 6	C / Y	O, V
<i>Pipilo maculatus</i>	spotted towhee	6	C / Y	O, V
CARDINALIDAE <i>Passerina caerulea salicaria</i>	CARDINALS & GROSBEAKS blue grosbeak	4	F / S	O
FRINGILLIDAE <i>Carduelis psaltria hesperophilus</i>	FINCHES lesser goldfinch	5, 6	C / Y	O, V
MAMMALS (Nomenclature from Baker et al. 2003)				
LEPORIDAE <i>Lepus californicus bennettii</i>	RABBITS & HARES San Diego black-tailed jackrabbit	4, 6		O
SCIURIDAE <i>Spermophilus beecheyi</i>	SQUIRRELS & CHIPMUNKS California ground squirrel	5		O
REPTILES (Nomenclature from Crother 2001 and Crother et al. 2003)				
IGUANIDAE <i>Phrynosoma blainvillii</i>	IGUANID LIZARDS coast horned lizard	1		O
<i>Sceloporus occidentalis</i>	western fence lizard	1		O
COLUBRIDAE <i>Pituophis catenifer annectens</i>	COLUBRID SNAKES San Diego gophersnake	1		O

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(cont.)

Scientific Name	Common Name	Treatment Area Number	On-site Abundance/ Seasonality (Birds Only)	Evidence of Occurrence
INVERTEBRATES (Nomenclature from Mattoni 1990; and Opler and Wright 1999)				
LYCAENIDAE Strymon melinus pudica	BLUES, COPPERS, & HAIRSTREAKS common or gray hairstreak	1		O
RIODINIDAE Apodemia virgulti	METALMARKS Behr's metalmark	1		O

Nomenclature from:

American Ornithologists' Union

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ATTACHMENT 3
WILDLIFE SPECIES OBSERVED/DETECTED DURING THE SPRING 2013 CACTUS WREN SURVEY
AT THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND ENHANCEMENT SITE
(cont.)

ABUNDANCE (based on Garrett and Dunn 1981)

- C = Common to abundant; almost always encountered in proper habitat, usually in moderate to large numbers
- F = Fairly common; usually encountered in proper habitat, generally not in large numbers
- U = Uncommon; occurs in small numbers or only locally

SEASONALITY (birds only)

- A = Accidental; species not known to occur under normal conditions; may be an off-course migrant
- M = Migrant; uses site for brief periods of time, primarily during spring and fall months
- S = Spring/summer resident; probable breeder on-site or in vicinity
- T = Transient; uses site regularly but unlikely to breed on-site
- V = Rare vagrant
- W = Winter visitor; does not breed locally
- Y = Year-round resident; probable breeder on-site or in vicinity

EVIDENCE OF OCCURRENCE

- B = Burrow
- C = Carcass/remains
- D = Den site
- FO = Fly overhead
- O = Observed
- S = Scat
- T = Track
- V = Vocalization

ATTACHMENT 4

ATTACHMENT 4
PLANT SPECIES OBSERVED WITHIN THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND ENHANCEMENT SITE

Scientific Name	Common Name	Treatment Area Number	Origin
LYCOPODS			
SELAGINELLACEAE	SPIKE-MOSS FAMILY		
<i>Selaginella bigelovii</i> L. Underw.	Bigelow spike-moss	1-6	N
<i>Selaginella cinerascens</i> A.A. Eaton	ashy spike-moss	1,2,4-6	N
ANGIOSPERMS: MONOCOTS			
AGAVACEAE	AGAVE FAMILY		
<i>Chlorogalum parviflorum</i> S. Watson	smallflower soap plant	2,4-6	N
IRIDACEAE	IRIS FAMILY		
<i>Sisyrinchium bellum</i> S. Watson	western blue-eyed-grass	6	N
POACEAE (GRAMINEAE)	GRASS FAMILY		
<i>Avena barbata</i> Link	slender wild oat	1,2,4-6	I
<i>Bromus hordeaceus</i> L.	soft chess	1,2,4-6	I
<i>Bromus madritensis</i> L. ssp. <i>rubens</i> (L.) Husnot	red brome	1-6	I
<i>Festuca</i> [= <i>Vulpia</i>] <i>myuros</i> L.	rattail sixweeks grass	1-6	I
<i>Festuca perennis</i> (L.) Columbus & J.P. Sm. [= <i>Lolium multiflorum</i> and <i>Lolium perenne</i>]	rye grass	1,4	I
<i>Gastridium ventricosum</i> (Gouan) Schinz & Thell.	nit grass	6	I
<i>Lamarckia aurea</i> (L.) Moench	goldentop	5	I
<i>Stipa</i> [= <i>Nassella</i>] sp.	needlegrass	1,2,4-6	N
<i>Stipa</i> [= <i>Achnatherum</i>] <i>diegoensis</i> Swallen	San Diego needlegrass	1	N
THEMIDACEAE	BRODIAEA FAMILY		
<i>Dichelostemma capitatum</i> (Benth.) A.W. Wood	blue dicks	4-6	N
ANGIOSPERMS: DICOTS			
ANACARDIACEAE	SUMAC OR CASHEW FAMILY		
<i>Malosma laurina</i> Nutt. ex Abrams	laurel sumac	1,2,4,5	N
<i>Rhus integrifolia</i> (Nutt.) Benth. & Hook. f. ex Rothr.	lemonadeberry	5	N
APIACEAE (UMBELLIFERAE)	CARROT FAMILY		
<i>Daucus pusillus</i> Michx.	rattlesnake weed	5	N

ATTACHMENT 4
PLANT SPECIES OBSERVED PLANT SPECIES OBSERVED WITHIN THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND
ENHANCEMENT SITE
(continued)

Scientific Name	Common Name	Treatment Area Number	Origin
ASTERACEAE	SUNFLOWER FAMILY		
<i>Artemisia californica</i> Less.	California sagebrush	1-6	N
<i>Baccharis sarothroides</i> A. Gray	broom baccharis	5,6	N
<i>Bahiopsis</i> [= <i>Viguiera</i>] <i>laciniata</i> (A. Gray) E.E. Schilling & Panero	San Diego County viguiera	1-6	N
<i>Centaurea melitensis</i> L.	totalote, Maltese star-thistle	1,4-6	I
<i>Corethrogyne filaginifolia</i> [= all previously known <i>Lessingia filaginifolia</i> varieties in California] (Hook. & Arn.) Nutt.	California-aster	4,5	N
<i>Deinandra</i> [= <i>Hemizonia</i>] <i>fasciculata</i> (DC.) Greene	golden tarplant	1-6	N
<i>Gutierrezia</i> sp.	matchweed	5,6	N
<i>Isocoma menziesii</i> (Hook. & Arn.) G.L. Nesom var. <i>decumbens</i> (Greene) G.L. Nesom	decumbent goldenbush	1,4-6	N
<i>Lasthenia gracilis</i> (DC.) Greene	common goldfields	4,5	N
<i>Logfia</i> [= <i>Filago</i>] <i>gallica</i> (L.) Cross. & Germ.	narrow-leaf herba impia	1,2,4,6	I
<i>Osmadenia tenella</i> Nutt.	Osmadenia	4-6	N
<i>Stylocline gnaphaloides</i> Nutt.	everlasting nest straw	3	N
BORAGINACEAE	BORAGE FAMILY		
<i>Cryptantha</i> sp.	cryptantha	4	N
BRASSICACEAE (CRUCIFERAE)	MUSTARD FAMILY		
<i>Hirschfeldia incana</i> (L.) Lagr.-Fossat	short-pod mustard	6	I
<i>Lepidium nitidum</i> Nutt. var. <i>nitidum</i>	shining peppergrass	1-6	N
CACTACEAE	CACTUS FAMILY		
<i>Cylindropuntia californica</i> (Torr. & A. Gray) F.M. Knuth var. <i>californica</i>	snake cholla	2,5	N
<i>Cylindropuntia</i> [= <i>Opuntia</i>] <i>prolifera</i> (Engelm.) F.M. Knuth	coast cholla	1-6	N
<i>Ferocactus viridescens</i> (Torr. & A. Gray) Britton & Rose	San Diego barrel cactus	1, 3-6	N
<i>Mammillaria dioica</i> K. Brandegee	fish-hook cactus	4-6	N
<i>Opuntia littoralis</i> (Engelm.) Cockerell.	shore cactus	1,2,5,6	N
CARYOPHYLLACEAE	PINK FAMILY		
<i>Silene gallica</i> L.	windmill pink	1,2,4-6	I

ATTACHMENT 4
PLANT SPECIES OBSERVED PLANT SPECIES OBSERVED WITHIN THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND
ENHANCEMENT SITE
(continued)

Scientific Name	Common Name	Treatment Area Number	Origin
CLEOMACEAE <i>Peritoma [=Isomeris] arborea</i> (Nutt.) H. H. Iltis	SPIDERFLOWER FAMILY bladderpod	1,5	N
CRASSULACEAE <i>Crassula connata</i> (Ruiz & Pav.) A. Berger <i>Dudleya pulverulenta</i> (Nutt.) Britton & Rose <i>Dudleya variegata</i> (S. Watson) Moran	STONECROP FAMILY pygmy-weed chalk lettuce, chalk dudleya variegated dudleya	1 1,2 5	N N N
EUPHORBIACEAE <i>Croton [=Eremocarpus] setigerus</i> Hook.	SPURGE FAMILY dove weed	4,6	N
FABACEAE (LEGUMINOSAE) <i>Acmispon glaber</i> (Vogel) Brouillet [= <i>Lotus scoparius</i>] <i>Acmispon micranthus</i> (Torr. & A. Gray) Brouillet [= <i>Lotus hamatus</i>]	LEGUME FAMILY deerweed grab lotus	1,4-6 3	N N
GENTIANACEAE <i>Zeltnera [=Centaurium] venusta</i> (A. Gray) G. Mans.	GENTIAN FAMILY canchalagua	4,5	N
GERANIACEAE <i>Erodium botrys</i> (Cav.) Bertol.	GERANIUM FAMILY long-beak filaree	1,2,4-6	I
LAMIACEAE <i>Salvia columbariae</i> Benth.	MINT FAMILY chia	6	N
NYCTAGINACEAE <i>Mirabilis laevis</i> [=californica] (Benth.) Curran var. <i>crassifolia</i> (Choisy) Spellenb.	FOUR O'CLOCK FAMILY wishbone bush	6	N
PLANTAGINACEAE <i>Plantago erecta</i> E. Morris	PLANTAIN FAMILY dot-seed plantain	1,4-6	N
POLEMONIACEAE <i>Linanthus dianthiflorus</i> (Benth.) Greene	PHLOX FAMILY farinose ground pink	5	N
POLYGONACEAE <i>Chorizanthe fimbriata</i> Nutt.	BUCKWHEAT FAMILY fringed spineflower	4	N

ATTACHMENT 4
PLANT SPECIES OBSERVED PLANT SPECIES OBSERVED WITHIN THE OTAY RANCH CACTUS WREN HABITAT RESTORATION AND
ENHANCEMENT SITE
(continued)

Scientific Name	Common Name	Treatment Area Number	Origin
<i>Eriogonum fasciculatum</i> Benth.	California buckwheat	1-6	N
SIMMONDSIACEAE	JOJOBA FAMILY		
<i>Simmondsia chinensis</i> (Link) C.K. Schneid.	jojoba, goat nut	1-6	N

Nomenclature from:

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Origin:

N = Native to locality

I = Introduced species from outside locality